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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Katherine H. Cornog

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EXAMINER

TUCKER, WESLEY J

ART UNIT

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2624

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/839,044	Applicant(s) CORN OG ET AL.	
	Examiner WESLEY TUCKER	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-10, 12-14 and 17-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-10, 12-14 and 17-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 17th has been entered.

Response to Amendment

2. Applicant's amendment filed November 17th 2008 has been entered and made of record.

3. Applicant has amended claims 1, 3, 5, 7-8, 12-14, 17 and 19-22. Claims 4, 11 and 15-16 are cancelled. Claims 1-3, 5-10, 12-14 and 17-22 are pending.

4. Applicant's arguments in view of the newly amended claims have been fully considered, but are not found persuasive for at least the following reasons:

Applicant has added the new claim limitation to independent claims 1 and 8 of:

“processing at least one of the two input images to generate an output image that includes a motion-based effect, wherein the processing uses the computed estimate of motion of the desired characteristic.”

Applicant argues that the reference to Sasaki does not disclose this newly added claim feature because Sasaki is concerned primarily with determining if and when a vehicle collision may occur.

Examiner respectfully disagrees and submits that Sasaki does disclose the newly claimed feature. Sasaki discloses examples of output images in Fig. 6 and Fig. 9. Sasaki determines motion between two input images. The images are then processed to form an output image such as Fig. 6 in which the edge images and their windows are taken together to calculate motion based effect, namely distance the tracked object travels from one image to the next. It should be noted that the Figure 6 is interpreted broadly as an output image, as it is output as a result of the calculations of motion between the two input images. Specifically the optical flow (F) is interpreted as the motion estimation and the motion-based effect of the output image is interpreted as the movement of the actual object from one image to the next. Sasaki is interpreted to read on the claim language and the rejection in view of Sasaki is accordingly maintained.

It should also be noted that applicant has cancelled limitations from the claim of using gradients and using a constraint on the desired characteristic so that the desired characteristic is constant from one image to a next image. In view of these cancelled limitations the independent claims are now considerably broader claims.

5. Claims 7 and 14 were previously objected to as containing allowable subject matter and depending on rejected claims. Upon review, these claims do not contain allowable subject matter and have accordingly been rejected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 2, 8, 9, 17, and 18-20 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Sasaki et al. (USPN 6,246,961).

Regarding claims 1, 2, and 17, Sasaki discloses ***generating a single channel image for each of two input images according to a function that measures, for each pixel, occurrence of a desired characteristic, other than luminance alone, in the input images at each pixel location to provide a value for an output pixel in the single channel image from a range of values that represent a likelihood of the occurrence of the desired characteristic*** (Sasaki col. 8 lines 29-46: The reference describes generating two edge images (i.e. single channel images) which correspond to two input images. Edge images measure the likelihood of an edge (i.e. a desired characteristic).).

Sasaki further discloses ***computing an estimate of motion of the desired characteristic between the two input images based on the single channel images generated for the two input images*** (Sasaki col. 8 lines 29-46: The reference

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describes detecting optical flow (i.e. a gradient based motion estimation method) between the two edge images (i.e. the single channel images). As is well known in the art—and stated throughout applicant's own disclosure—the optical flow calculation uses a constant constraint between two images. Since these two images represent the desired characteristic, the claim limitation is met. This is confirmed by applicant's own disclosure in several instances (see e.g. at paragraph [0003] and [0045].).

Sasaki further discloses **processing at least one of the two input images to generate an output image that includes a motion-based effect, wherein the processing uses the computed estimate of motion of the desired characteristic**

(Figures 6 and 9, Sasaki determines motion between two input images. The images are then processed to form an output image such as Fig. 6 in which the edge images and their windows are taken together to calculate motion based effect, namely distance the tracked object travels from one image to the next. It should be noted that the Figure 6 is interpreted broadly as an output image, as it is output as a result of the calculations of motion between the two input images. Specifically the optical flow (F) is interpreted as the motion estimation and the motion-based effect of the output image is interpreted as the movement of the actual object from one image to the next).

Regarding claims 8, 9, and 18-20 Sasaki discloses an apparatus for performing the method of claim 1 (see figure 1).

With regard to new claims 21 and 22, Sasaki discloses detecting optical flow (Fig. 8).

With regard to newly amended claims 17 and 18, the amended limitations were previously contained in independent claims 1 and 8. Sasaki discloses **wherein computing the estimate of motion uses a gradient based method that uses the single channel images generated for the two input images and a constraint that a total of the desired characteristic is constant from one image to the next and wherein the gradient based method includes computing optical flow for the single channel images** (Sasaki col. 8 lines 29-46: The reference describes detecting optical flow (i.e. a gradient based motion estimation method) between the two edge images (i.e. the single channel images). As is well known in the art—and stated throughout applicant's own disclosure—the optical flow calculation uses a constant constraint between two images. Since these two images represent the desired characteristic, the claim limitation is met. This is confirmed by applicant's own disclosure in several instances (see e.g. at paragraph [0003] and [0045]).

With regard to claim 19, Sasaki discloses the method of claim 17, ***wherein the gradient-based method comprises computing, for each pixel in an image, a vector that describes the motion the pixel from one image to the next*** (column 1, lines 54-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5-6, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki as applied above, and further in view of Von Brandt (USPN 4,924,310).

Regarding claim 5, Sasaki discloses detecting a potential collision according to the estimate of motion, but fails to expressly disclose **wherein performing the motion-based effect includes generating several images from the two input images according to an interpolation of the computed estimate of motion over time to interpolate between the two images.**

Von Brandt, however, discloses using a motion estimate to interpolate between two images and teaches that multiple images between the two images can be calculated (Von Brandt col. 1 lines 40-54). Von Brandt teaches that if every third image frame is sampled, those image frames can be used to interpolate and determine the other two images that occur between the sampled frames. It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Sasaki's motion estimation method by using the estimate to interpolate between two images as taught by Von Brandt. Such a modification would have allowed for the reconstruction of missing image frames (Von Brandt col. 1 lines 40-42).

Regarding claim 6, Sasaki discloses that the desired characteristic is edge magnitude. This limitation was discussed in the 102 rejection.

Regarding claims 11-13, Sasaki disclose an apparatus for performing the method (see figure 1).

8. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Sasaki as applied above, and further in view of Kobilansky (U.S. Pat. Pub. No. US2002/0159749 A1).

Regarding claim 3, Sasaki discloses a desired characteristic, but fails to expressly disclose that this ***desired characteristic is proximity to a color; and the function measures the proximity to a color of a region around each pixel***. Kobilansky, in the same field of endeavor of image processing and the same problem solving area of motion estimation, discloses a motion estimation technique that takes into account the proximity to a color (see paragraph [0015]: The reference describes that a region in the target frame should have a color close (i.e. proximity to a color) to the same region in the reference frame.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Sasaki by having the desired characteristic as proximity to a color as taught in Kobilansky because the use of such a desired characteristic “provides enhancements to the process of estimating motion in image-sequences such as those that originate from motion pictures or television video” (see Kobilansky: paragraph [0004]).

Regarding claim 10, Sasaki discloses an apparatus for performing the method (see figure 1.)

9. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Sasaki and Von Brandt as applied above, and further in view of Kobilansky (U.S. Pat. Pub. No. US2002/0159749 A1).

The arguments as to the relevance of Sasaki and Von Brandt (and Kobilansky) as applied above are incorporated herein.

The limitations of the claim and the motivation to combine references have been discussed in the above two paragraphs. A separate paragraph was required for these two claims because of the different dependency.

Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wes Tucker/

Examiner, Art Unit 2624